IN THE CLAIMS:

1. (Currently Amended) An imaging system for high energy radiation direct conversion scan imaging, comprising:

a high energy radiation source member;

a semiconductor high energy radiation direct conversion imaging device, including a plurality of individually addressable imaging cells, each imaging cell comprising a detector cell and a readout cell for producing individual imaging cell output values representative of high energy radiation incident on said detector cell, said imaging device comprising an imaging area, having a length and a width comprising plural rows and columns of imaging cells, each extending generally orthogonally to the direction of radiation transmission, and a thickness, extending generally in the direction of radiation transmission, which is substantially shorter than both said length and said width;

said source member and/or said imaging device arranged to move substantially continuously relative to an object position for scanning an object at said object position; and

wherein said readout cells are arranged to readout said individually addressable imaging cell output values at time intervals substantially corresponding to an object image point traversing half the distance or less of a detector region in the scanning direction during a scan.

2. (Currently Amended) An imaging system according to claim 1, arranged to read out an image cell value from each of ~~at least~~ a subset of said plurality of imaging cells during each of said time intervals.

3. (Original) An imaging system according to claim 1, wherein said source member and/or said imaging device are moveable to image a part of an object in said object position from two or more positions.

4. (Original) An imaging system according to claim 1, wherein said source member and/or said imaging device are arranged to rotatably move relative to said object position.

5. (Currently Amended) An imaging system according to claim 4, said ~~course~~ source member and/or said imaging device are rotatably moveable about a moveable axis of rotation.

6. (Original) A dental panoramic imaging system comprising an imaging system according to claim 1.

7. (Currently Amended) A dental computerised ~~tomoraphy~~ tomography imaging system comprising an imaging system according to claim 1.

8. (Original) An imaging system according to claim 1, for in-line high energy radiation inspection system, wherein said source member and/or said imaging device are arranged for linear movement relative to said object position.

9. (Original) An imaging system according to claim 1, wherein said source member comprises a support for a high energy radiation source.

10. (Original) An imaging system according to claim 1, wherein said source member comprises a high energy radiation source.

11. (Original) An imaging system according to claim 9, wherein said high energy radiation source comprises a steerable beam high energy radiation source.

12. (Original) An imaging system according to claim 11, wherein said steerable beam high energy radiation source comprises an electrically steerable beam.

13. (Original) An imaging system according to claim 9, wherein said high energy radiation source is operated to continuously radiate said high energy radiation during said scanning.

14. (Previously Presented) An imaging system according to claim 1, wherein said imaging device is arranged to readout said imaging cell output values at time intervals corresponding to an object image point traversing a part of said detector region.

15. (Previously Presented) An imaging system according to claim 14, wherein said imaging device is arranged to readout said imaging cell output values at time intervals substantially corresponding to an object image point traversing half a detector region.

16. (Previously Presented) An imaging system according to claim 1, wherein said readout cell is arranged to readout said imaging cell output values during said traversing of said detector region.

17. (Previously Presented) An imaging system according to claim 16, wherein said readout cells are arranged to readout said imaging cell output values substantially continuously during said traversing of said detector region.

18. (Original) An imaging system according to claim 1, wherein said detector region comprises a detector cell.

19. (Previously Presented) An imaging system according to claim 1, wherein said readout cells are arranged to readout said imaging cell output values after said traversing.

20. (Previously Presented) An imaging system according to claim 1, wherein said readout cells are arranged to readout said imaging cell output values at a rate of substantially 5MHz or more.

21. (Previously Presented) An imaging system according to claim 20, wherein said readout cells are arranged to readout said imaging cell output values at a rate greater than 10MHz.

22. (Previously Presented) An imaging system according to claim 21, wherein said readout cells are arranged to readout said imaging cell output values at a rate of 20MHz or more.

23. (Previously Presented) An imaging system according to claim 1, wherein said imaging device is arranged to readout imaging cell output values for at least some of said plurality of imaging cells of said imaging device.

24. (Original) An imaging system according to claim 1, comprising a plurality of imaging devices.

25. (Original) An imaging system according to claim 24, wherein each of said plurality of imaging devices are readout individually.

26. (Original) An imaging system according to claim 24, wherein two or more imaging devices are coupled together for reading out said imaging cell output values from more than one imaging device.

27. (Original) An imaging system according to claim 1, interfaceable to data acquisition and control apparatus for receiving and storing imaging cell output values.

28. (Original) An imaging system according to claim 27, wherein said data acquisition and control apparatus comprises a personal computer.

29. (Previously Presented) An imaging system according to claim 28, interfaceable to said personal computer, or to a notebook or to a laptop computer using an USB interface bus.

30. (Previously Presented) An imaging system according to claim 28, interfaceable to said personal computer, or to a notebook or to a laptop computer using an USB2 interface bus.

31. (Original) An imaging system according to claim 1, said readout cells comprising high speed integrated circuitry.

32. (Currently Amended) An imaging system according to claim 31, said readout cells comprising circuitry fabricated in accordance with one or more of the following technologies:

CMOS; Double Poly MOS; NMOS; ~~JPFGT~~ JFET; P2CMOS; XMOS; GaAs integrated circuit processes; ECL; TTL; Bipolar Linear; BiCMOS; EEPROM/PLASH process; SALICIDE process; OP to electronics; Complementary Bipolar DLM2; Copper Fine Line; and BCD C Bipolar/CMOS/DMOS.

33. (Currently Amended) A method of high energy radiation direct conversion scan imaging using an imaging system including:

a high energy radiation source member; and

a semiconductor high energy radiation direct conversion imaging device including a plurality of individually addressable imaging ~~image~~ cells, each imaging cell comprising a detector cell and a readout cell for producing imaging cell output values representative of high energy radiation incident on said detector cell, said imaging device comprising an imaging area, having a length and a width comprising plural rows and columns of imaging cells, each extending generally orthogonally to the direction of radiation transmission, and a thickness, extending generally in the direction of radiation transmission, which is substantially shorter than both said length and said width;

the method comprising:

moving said source member and/or said imaging device substantially continuously relative to an object position for scanning an object of said object position; and

reading out imaging cell output values at time intervals substantially corresponding to an object image point traversing half the distance of a detector region in the direction of scanning.

34. (Currently Amended) A method according to claim 33, wherein said reading out step includes reading out an image cell value from each of ~~at least~~ a subset of said plurality of imaging cells during each of said time intervals.

35. (Original) A method according to claim 33, wherein said step of moving comprises moving said source member and/or imaging device to image a part of an object in said object position from two or more positions.

36. (Original) A method according to claim 33, further comprising arranging said source member and/or said imaging device to rotatably move relative to said object position.

37. (Original) A method according to claim 36, wherein said source member and/or said imaging device are arranged for a rotatable movement about a movable axis of rotation.

38 - 40. (Canceled)

41. (Original) A method according to claim 33, wherein said high energy radiation source member comprises a high energy radiation source continuously operated to radiate high energy radiation during scanning.

42. (Original) A method according to claim 33, wherein said step of reading out comprises reading out imaging cell output values at time intervals corresponding to an object image point traversing a part of said detector region.

43. (Original) A method according to claim 33, wherein said step comprises reading out imaging cell output values at time intervals substantially corresponding to an object image point traversing half of a detector region.

44. (Original) A method according to claim 33, wherein said step of reading comprises reading out imaging cell output values during said traversing of said detector region.

45. (Currently Amended) A method according to any one of claim 33, wherein said detector region comprises a detector ~~call~~ cell.

46. (Original) A method according to claim 33, wherein said step of reading comprises reading image cell output values for at least some of said plurality of imaging cells of said imaging device.

47. (Original) A method according to claim 33, for an imaging system including a plurality of imaging devices, and wherein said step of reading comprises reading each of said plurality of imaging device individually.

48. (Original) A method according to claim 33, for an imaging system comprising a plurality of imaging devices having two or more imaging devices coupled together, and wherein said step of reading comprises reading out image cell output values from more than one imaging device.

49. (Previously Presented) An imaging system according to claim 1, wherein said imaging device is arranged to readout the imaging cell output values at a frame rate of 60 frames/second.

50. (Previously Presented) An imaging system according to claim 1, wherein said imaging device is arranged to readout the imaging cell output values at a frame of 200 frames/second.

51. (Previously Presented) An imaging system according to claim 1, wherein said imaging device is arranged to readout the imaging cell output values at a frame rate of 200 frames/second.

52. (New) An imaging system according to claim 1, wherein the thickness of the imaging device substantially comprises the combined thickness of a detector cell and a readout cell, which are arranged one above the other in the direction of radiation transmission.

53. (New) An imaging system according to claim 1, wherein the scanning direction is substantially along a width axis of the imaging device.

54. (New) An imaging system according to claim 1, which is arranged to provide imaging data for generating plural tomographic image planes of an object from a single imaging scan operation.

55. (New) An imaging system according to claim 6, which is arranged to provide imaging data for generating plural tomographic image planes of an object from a single imaging scan operation.

56. (New) An imaging system according to claim 7, which is arranged to provide imaging data for generating plural tomographic image planes of an object from a single imaging scan operation.

57. (New) An imaging system according to claim 6, which is arranged to provide imaging data for performing a dental panoramic reconstruction, comprising plural sharp layers following the center line of teeth in a skull, from a single imaging scan operation.

58. (New) An imaging system according to claim 7, which is arranged to provide imaging data for performing a dental panoramic reconstruction, comprising plural sharp layers following the center line of teeth in a skull, from a single imaging scan operation.

59. (New) An imaging system according to claim 6, which is arranged to provide imaging data for performing reconstruction of plural different dental arch configurations, from a single imaging scan operations.

60. (New) An imaging system according to claim 7, which is arranged to provide imaging data for performing reconstruction of plural different dental arch configurations, from a single imaging scan operations.

61. (New) An imaging system according to claim 6, which is arranged to provide imaging data for constructing plural images, each comprising a sharp layer of different depth and profile, by shifting and adding several stored image frames taken from a single imaging scan operation.

62. (New) An imaging system according to claim 7, which is arranged to provide imaging data for constructing plural images, each comprising a sharp layer of different depth and profile, by shifting and adding several stored image frames taken from a single imaging scan operation.

63. (New) A method according to claim 33, including the step of providing imaging data for performing a dental panoramic reconstruction, comprising plural sharp layers following the center line of teeth in a skull, from a single imaging scan operation.

64. (New) A method according to claim 33, including the step of providing imaging data for performing reconstruction of plural different dental arch configurations, from a single imaging scan operation.

65. (New) A method according to claim 33, including the step of providing imaging data for constructing plural images, each comprising a sharp layer of different depth and profile, by shifting and adding several stored image frames taken from a single imaging scan operation.

66. (New) An imaging system for high energy radiation direct conversion scan imaging, which is arranged to provide imaging data for generating plural tomographic image planes of an object from a single imaging scan operation, comprising:

a high energy radiation source member;

a semiconductor high energy radiation direct conversion imaging device including a plurality of imaging cells, each imaging cell being individually addressable and comprising a detector cell and a readout cell for producing imaging cell output values representative of high energy radiation incid3nt on said detector cell;

said source member and/or said imaging device arranged to move substantially continuously relative to an object position for scanning an object at said object position;

and wherein said readout cells are operable to readout said individually addressable imaging cell output values at time intervals substantially corresponding to an object image point traveling half the distance or less of a detector region in the scanning direction during a scan.

67. (New) A method of high energy radiation direct conversion scan imaging using an imaging system, which is arranged to provide imaging data for generating plural tomographic image planes of an object from a single imaging scan operation, the system including:

a high energy radiation source member;

and a semiconductor high energy radiation direct conversion imaging device including a plurality of image cells, each imaging cell being individually addressable and comprising a detector cell and a readout cell for producing imaging cell output values representative of high energy radiation incident on said detector cell;

the method comprising:

moving said source member and/or said imaging device substantially continuously

relative to an object position for scanning an object of said object position; and

reading out individually addressable imaging cell output values at time intervals substantially corresponding to an object image pointy traversing half the distance of a detector region in the direction of scanning.